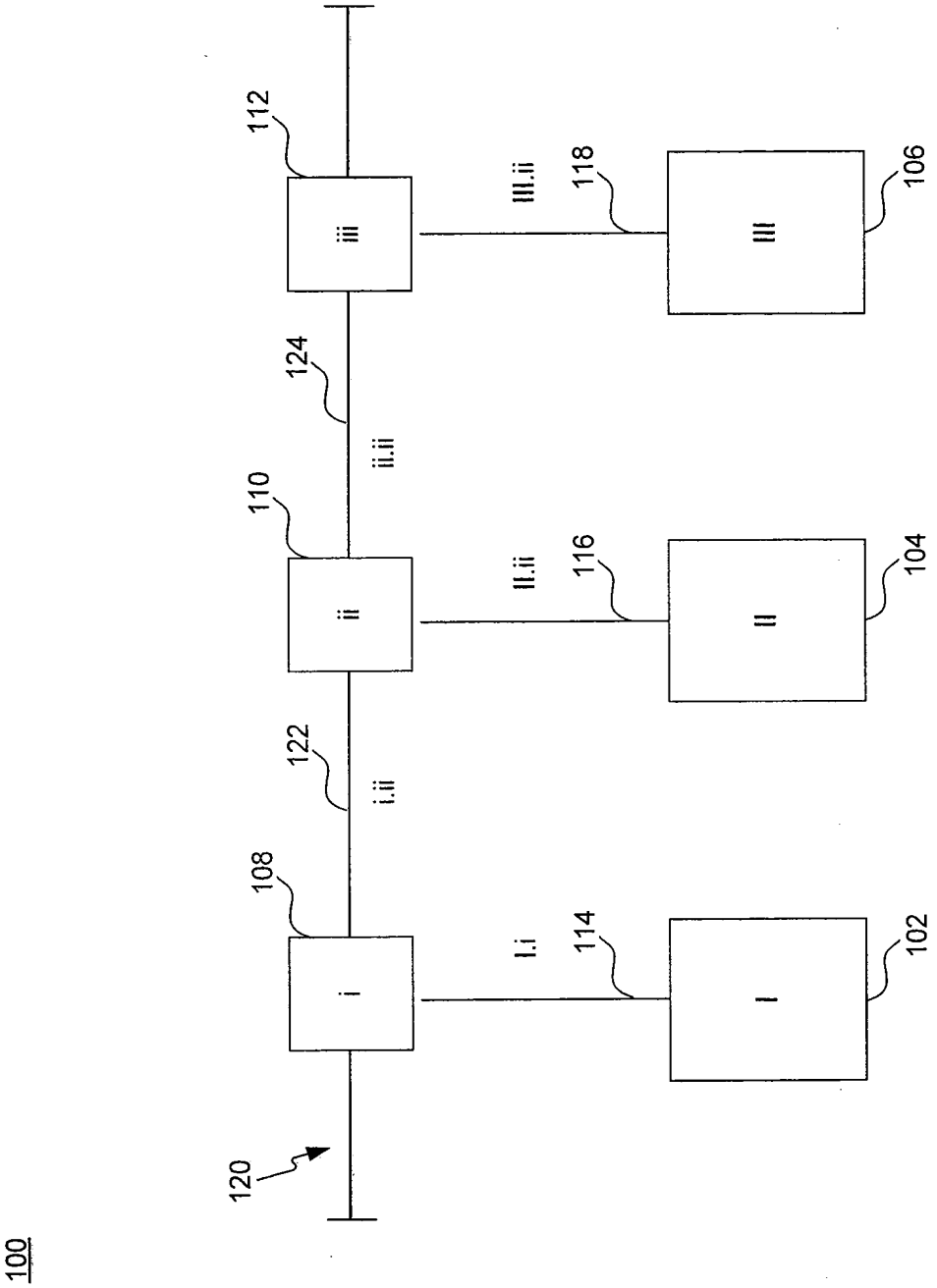
100
120
112
iii
III.ii
118
III
106
124
ii.ii
110
ii
II.ii
116
II
104
122
i.ii
108
i
I.i
114
I
102

FIG. 1

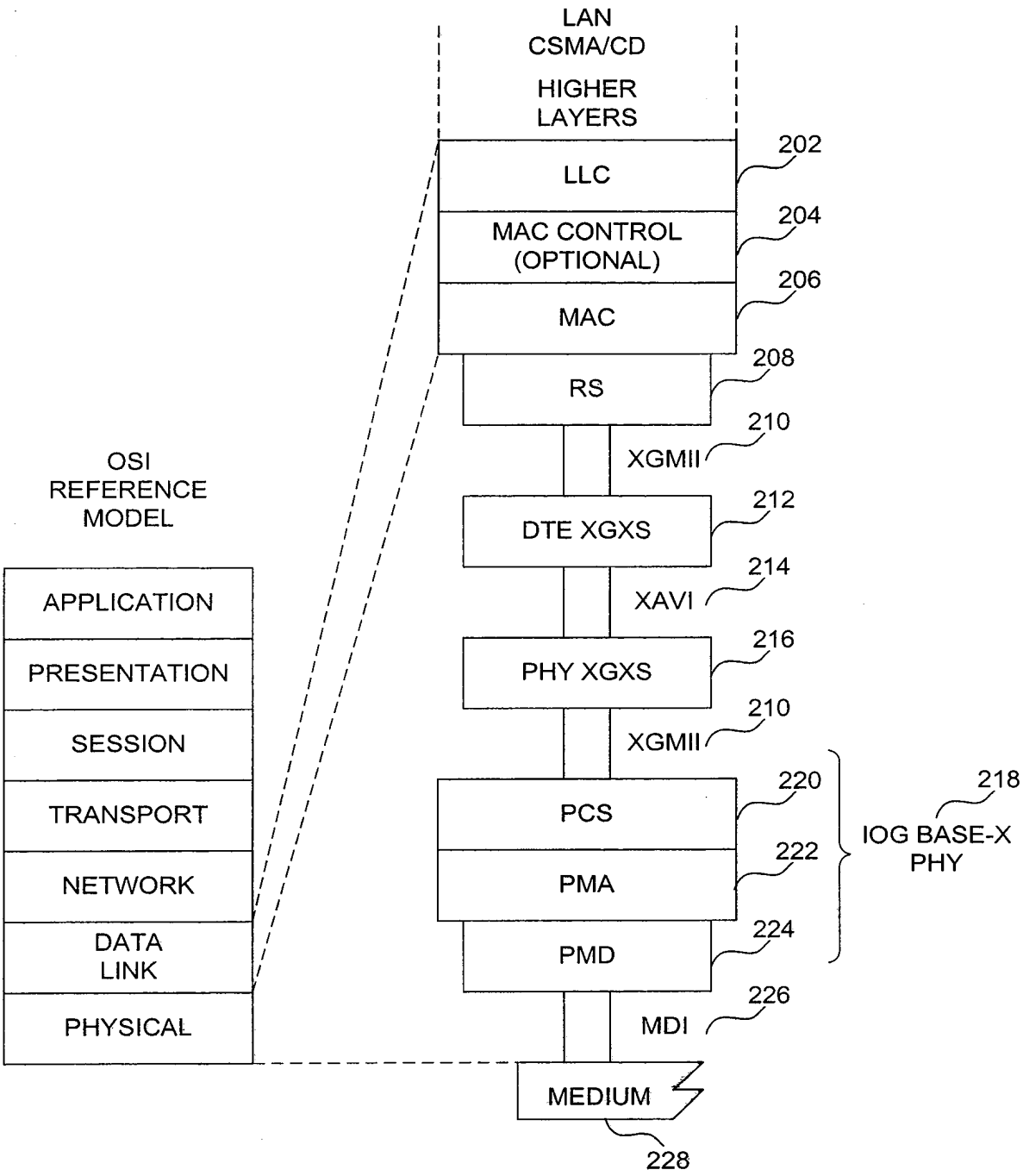
200
LAN
CSMA/CD
HIGHER
LAYERS
LLC
202
MAC CONTROL
(OPTIONAL)
204
MAC
206
RS
208
XGMII
210
DTE XGXS
212
XAVI
214
PHY XGXS
216
XGMII
210
PCS
220
PMA
222
PMD
224
10G BASE-X
PHY
218
MDI
226
MEDIUM
228
OSI
REFERENCE
MODEL
APPLICATION
PRESENTATION
SESSION
TRANSPORT
NETWORK
DATA
LINK
PHYSICAL

FIG. 2

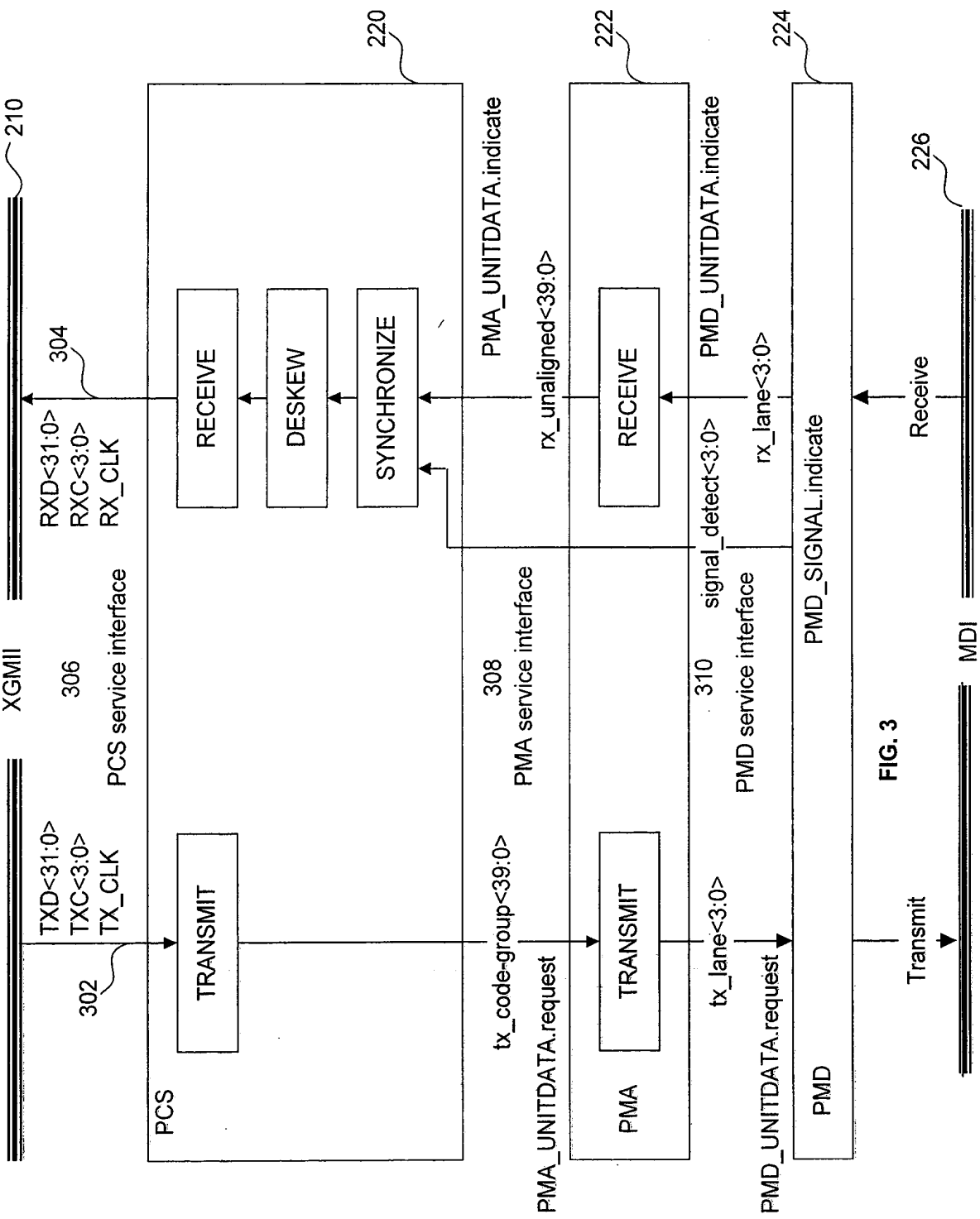
210
XGMII
220
222
224
226
304
306
308
310
302
RXD<31:0>
RXC<3:0>
RX_CLK
TXD<31:0>
TXC<3:0>
TX_CLK
PCS service interface
PMA service interface
PMD service interface
RECEIVE
DESKEW
SYNCHRONIZE
TRANSMIT
PMA_UNITDATA.indicate
rx_unaligned<39:0>
PMD_UNITDATA.indicate
rx_lane<3:0>
signal_detect<3:0>
PMD_SIGNAL.indicate
Receive
Transmit
MDI
tx_code-group<39:0>
PMA_UNITDATA.request
tx_lane<3:0>
PMD_UNITDATA.request
PCS
PMA
PMD

FIG. 3

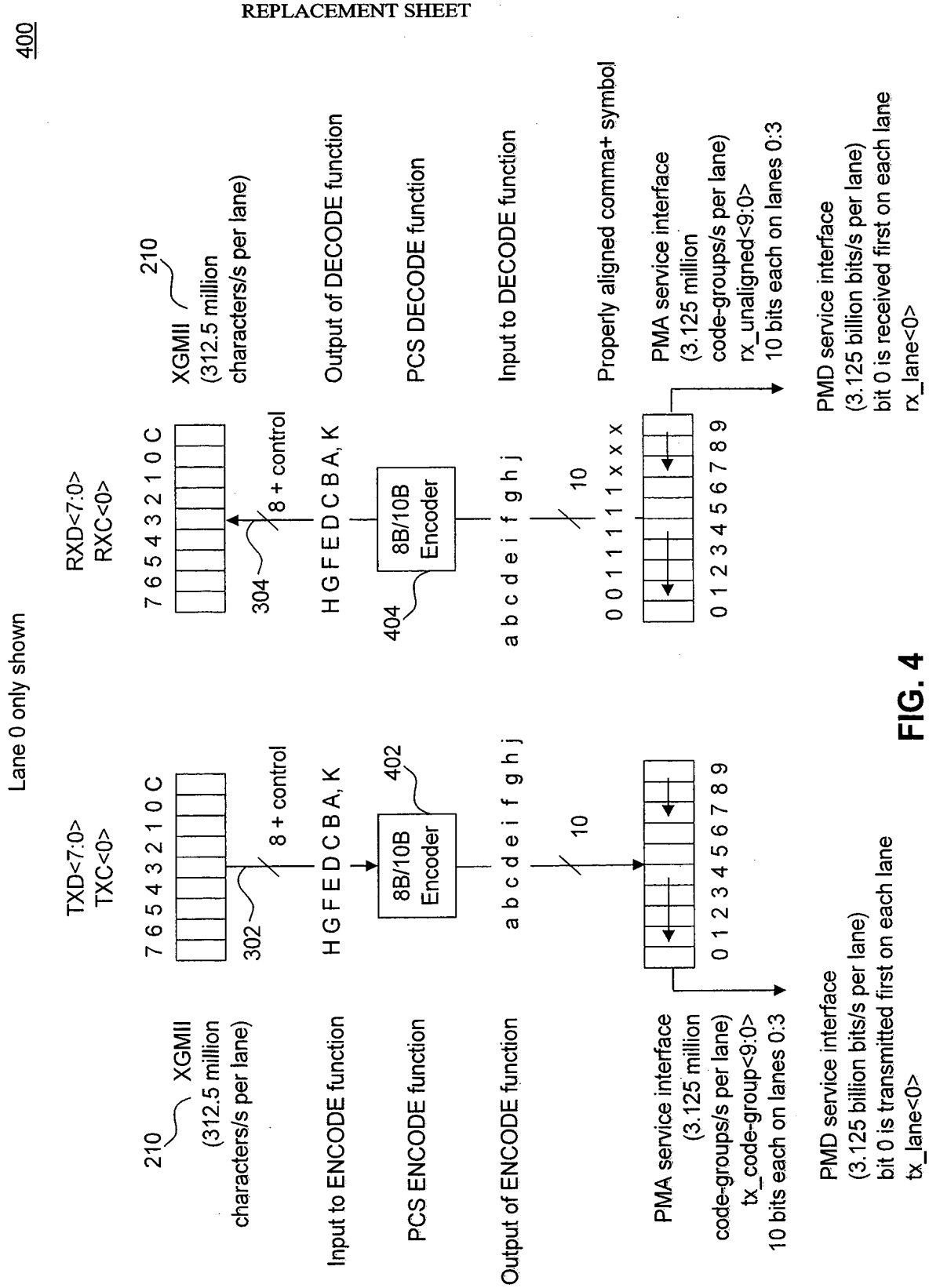
400
Lane 0 only shown
TXD<7:0>
TXC<0>
7 6 5 4 3 2 1 0 C
210
XGMII
(312.5 million
characters/s per lane)
302
8 + control
H G F E D C B A, K
Input to ENCODE function
8B/10B
Encoder
402
PCS ENCODE function
a b c d e i f g h j
Output of ENCODE function
10
PMA service interface
(3.125 million
code-groups/s per lane)
tx_code-group<9:0>
10 bits each on lanes 0:3
PMD service interface
(3.125 billion bits/s per lane)
bit 0 is transmitted first on each lane
tx_lane<0>
RXD<7:0>
RXC<0>
7 6 5 4 3 2 1 0 C
210
XGMII
(312.5 million
characters/s per lane)
304
8 + control
H G F E D C B A, K
Output of DECODE function
8B/10B
Encoder
404
PCS DECODE function
a b c d e i f g h j
Input to DECODE function
10
0 0 1 1 1 1 1 x x x
Properly aligned comma+ symbol
PMA service interface
(3.125 million
code-groups/s per lane)
rx_unaligned<9:0>
10 bits each on lanes 0:3
0 1 2 3 4 5 6 7 8 9
PMD service interface
(3.125 billion bits/s per lane)
bit 0 is received first on each lane
rx_lane<0>

FIG. 4

XGMII TXC	XGMII TXD	PCS code-group	Description
0	00 through FF	Dxx.y	Normal data transmission
1	07	K28.0 or K28.3 or K28.5	Idle in ||I||
1	07	K28.5	Idle in ||T||
1	9C	K28.4	Sequence
1	FB	K27.7	Start
1	FD	K29.7	Terminate
1	FE	K30.7	Error
1	Other value in Table 36-2	See Table 36-2	Reserved XGMII character
1	Any other value	K30.7	Invalid XGMII character
NOTE—Values in TXD column are in hexadecimal.			

Table 36–2–Valid special code-groups

Code Group Name	Octet Value	Octet Bits HGF EDCBA	Current RD - abcdei fghj	Current RD + abcdei fghj	Notes
K28.0	1C	000 11100	001111 0100	110000 1011	1
K28.1	3C	001 11100	001111 1001	110000 0110	1,2
K28.2	5C	010 11100	001111 0101	110000 1010	1
K28.3	7C	011 11100	001111 0011	110000 1100	1
K28.4	9C	100 11100	001111 0010	110000 1101	1
K28.5	BC	101 11100	001111 1010	110000 0101	2
K28.6	DC	110 11100	001111 0110	110000 1001	1
K28.7	FC	111 11100	001111 1000	110000 0111	1,2
K23.7	F7	111 10111	111010 1000	000101 0111	
K27.7	FB	111 11011	110110 1000	001001 0111	
K29.7	FD	111 11111	101110 1000	010001 0111	
K30.7	FE	111 11110	011110 1000	100001 0111	
NOTE 1 — Reserved.					
NOTE 2 — Contains a comma.					

FIG. 5

Code	Ordered_Set	Number of code-groups	Encoding
||I||	**Idle**		Substitute for XGMII Idle
||K||	Sync column	4	/K28.5/K28.5/K28.5/K28.5/
||R||	Skip column	4	/K28.0/K28.0/K28.0/K28.0/
||A||	Align column	4	/K28.3/K28.3/K28.3/K28.3/
	Encapsulation		
||S||	Start column	4	/K27.7/Dx.y/Dx.y/Dx.y/[a]
||T||	Terminate column	4	Terminate code-group in any lane
||T_0||	Terminate in Lane 0	4	/K29.7/K28.5/K28.5/K28.5/
||T_1||	Terminate in Lane 1	4	/Dx.y/K29.7/K28.5/K28.5/[a]
||T_2||	Terminate in Lane 2	4	/Dx.y/Dx.y/K29.7/K28.5/[a]
||T_3||	Terminate in Lane 3	4	/Dx.y/Dx.y/Dx.y/K29.7/[a]
	Control		
/E/	Error code-group	1	/K30.7/
	Link Status		
||Q||	Sequence ordered_set	4	/K28.4/Dx.y/Dx.y/Dx.y/[a]
||LF||	Local Fault signal	4	/K28.4/D0.0/D0.0/D1.0/
||RF||	Remote Fault signal	4	/K28.4/ D0.0/D0.0/D2.0/
||Qrsvd||	Reserved	4	||LF|| and ||RF||
	Reserved		
||Fsig||	Signal ordered_set	4	/K28.2/Dx.y/Dx.y/Dx.y/ [a,b]

[a]/Dx.y/ indicates any data code-group.
[b]/Reserved for INCITS T11.

FIG. 6

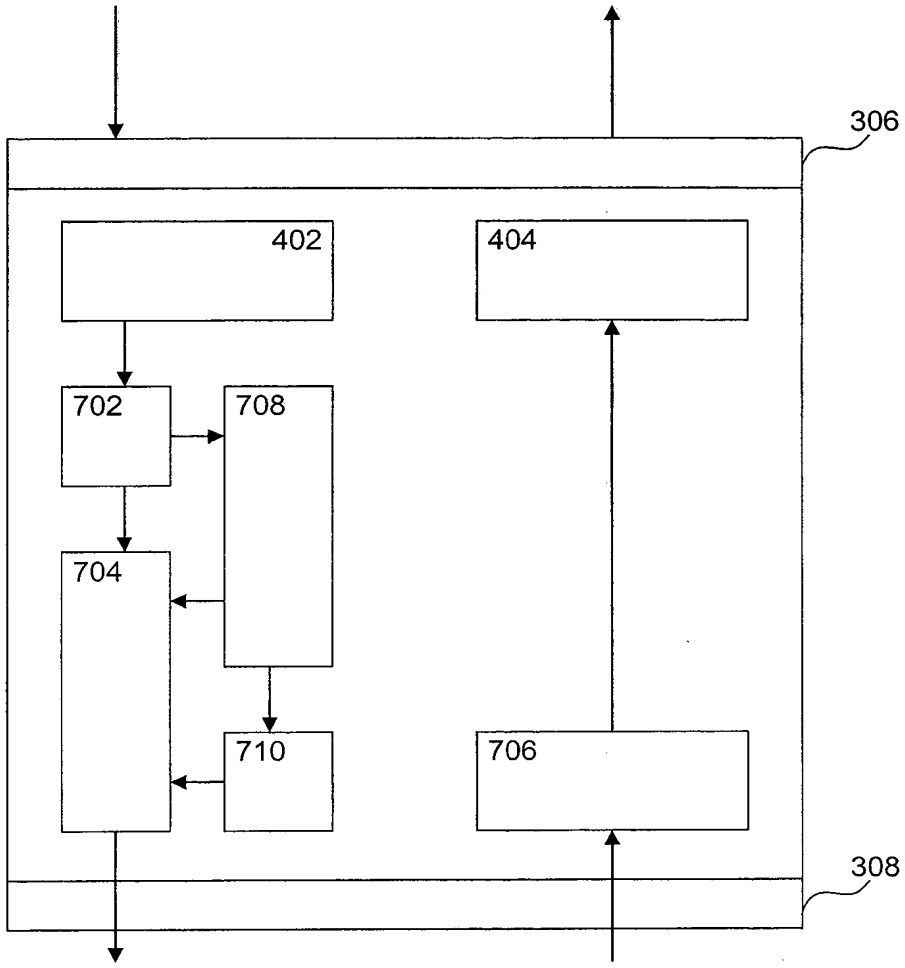

FIG. 7

800

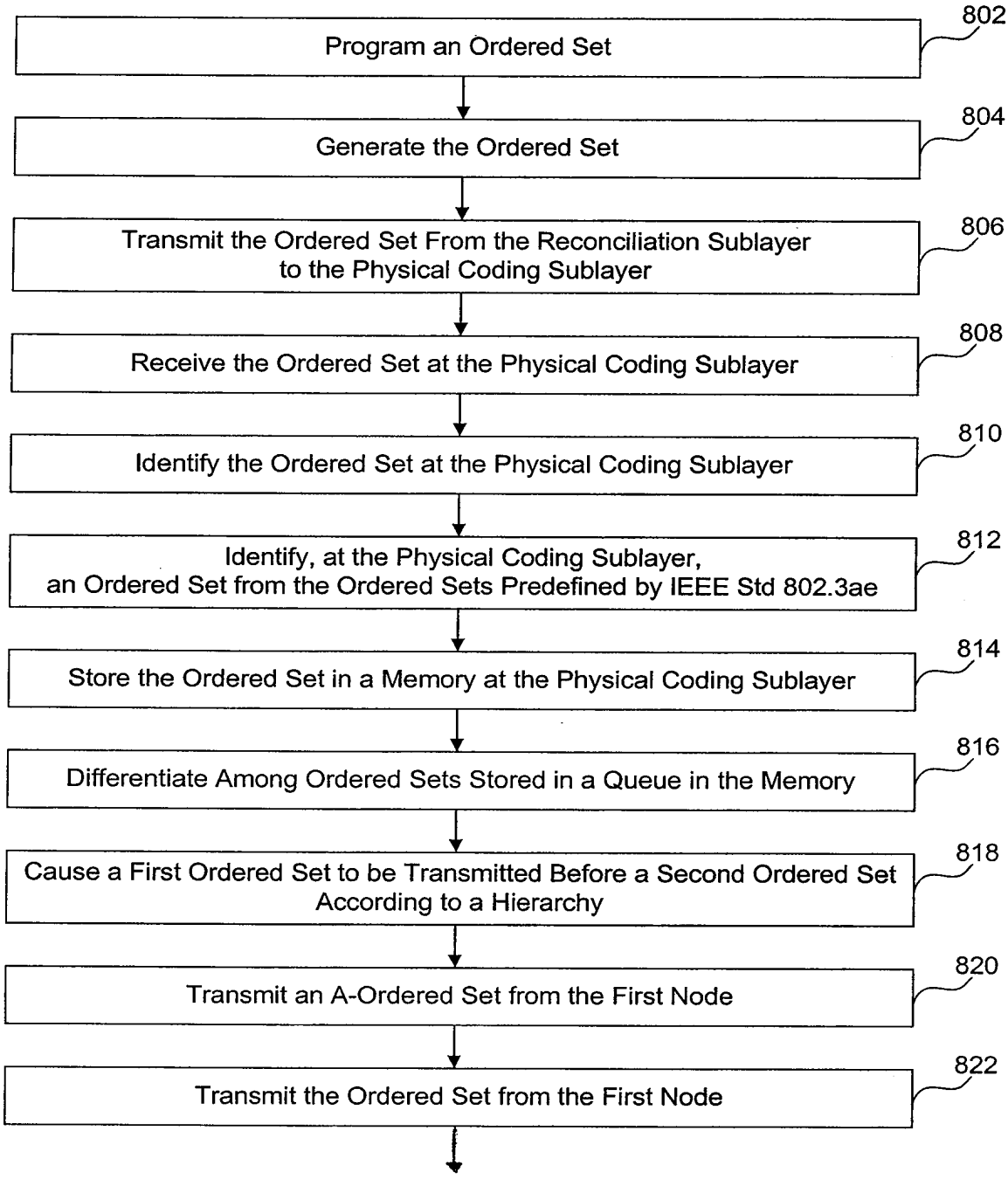
Program an Ordered Set
802
Generate the Ordered Set
804
Transmit the Ordered Set From the Reconciliation Sublayer to the Physical Coding Sublayer
806
Receive the Ordered Set at the Physical Coding Sublayer
808
Identify the Ordered Set at the Physical Coding Sublayer
810
Identify, at the Physical Coding Sublayer, an Ordered Set from the Ordered Sets Predefined by IEEE Std 802.3ae
812
Store the Ordered Set in a Memory at the Physical Coding Sublayer
814
Differentiate Among Ordered Sets Stored in a Queue in the Memory
816
Cause a First Ordered Set to be Transmitted Before a Second Ordered Set According to a Hierarchy
818
Transmit an A-Ordered Set from the First Node
820
Transmit the Ordered Set from the First Node
822

FIG. 8A

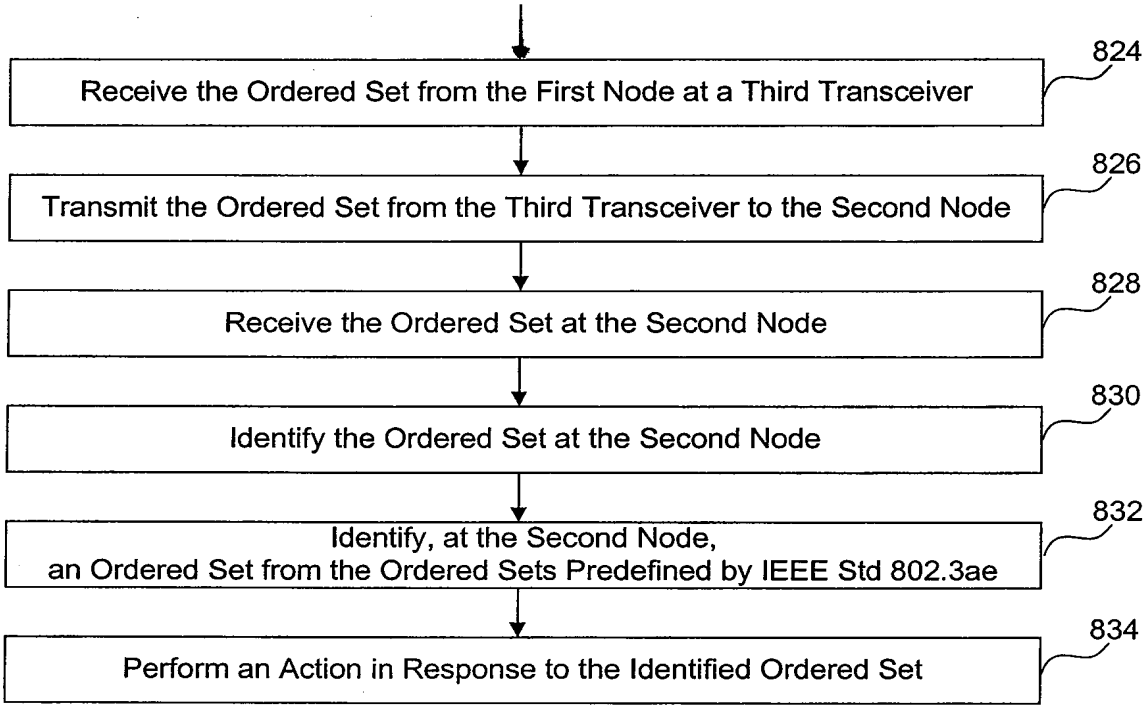
Receive the Ordered Set from the First Node at a Third Transceiver
824
Transmit the Ordered Set from the Third Transceiver to the Second Node
826
Receive the Ordered Set at the Second Node
828
Identify the Ordered Set at the Second Node
830
Identify, at the Second Node,
an Ordered Set from the Ordered Sets Predefined by IEEE Std 802.3ae
832
Perform an Action in Response to the Identified Ordered Set
834

FIG. 8B

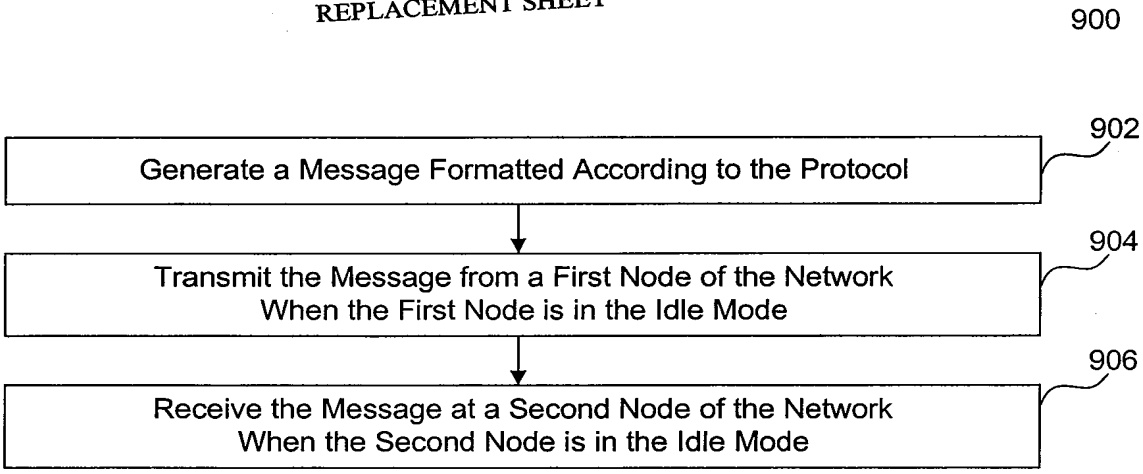
900
902
Generate a Message Formatted According to the Protocol
904
Transmit the Message from a First Node of the Network When the First Node is in the Idle Mode
906
Receive the Message at a Second Node of the Network When the Second Node is in the Idle Mode

FIG. 9